

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method of converting (i) solid fossil fuels, ~~including coal~~, or (ii) oil tars obtained by distillation of coal, turf, grass, ~~glucose~~, rubber, sapropel, sapropelites, slates, ~~and~~or wood,

into synthetic petroleum, comprising the steps of:

- a) isolating a starting microorganism capable of said conversion;
- b) isolating from the starting microorganism the genes responsible for the conversion ability;
- c) transfecting the genes into a host microorganism, and
- d) combining the host microorganism with the solid fossil fuels or oil tars under conditions suitable for the conversion of the solid fossil fuels or oil tars into synthetic petroleum.

2. (Canceled)

3. (Currently amended) The method of claim 1 wherein the starting microorganism is Thiobacillus aquaesullis aquaesulis 4255 or 389, Thiosphaera pantotropha 356, Thiosphaera pantotropha 2944, Thiobacillus thioiparus 55, or mutants or variants thereof, or a microorganism which exists naturally in water ~~including deep water~~.

4. (Currently amended) The method of claim 1 [[or 2]] wherein, after transfection, the transfected host microorganism, as compared to the starting microorganism, is capable of faster growth, reproduction, enhanced survivability in ~~the~~ a production environment, or more production of synthetic petroleum per unit of (i) a nutrient or (ii) a starting fossil fuel or oil tar, than is the starting microorganism.

5. (Currently amended) The method of claim 4 wherein the host microorganism can exist in salt water or fresh water, can metabolize glucose or other nutrient media, ~~can exist in rocky, sandy or sand/water environments, can survive heat, cold, or~~ acidic or basic environments, can oxidize sulfur, or can exist in aerobic or anaerobic conditions.
6. (Currently amended) The method of claim 1 [[or 2]]wherein the genes responsible for conversion are isolated by subtractive hybridization.
7. (Original) The method of claim 6 wherein the subtractive hybridization is performed by representational difference analysis.
8. (Currently amended) The method of claim 1 [[or 2]]wherein before transfection, the genes are selectively altered, and following transfection with such selectively altered genes, the host microorganisms with characteristics best suited to commercial production of synthetic petroleum are selected.
9. (Currently amended) A method of improving converting conversion of (i) solid fossil fuels, including coal, or (ii) oil tars obtained by distillation of coal, turf, grass, ~~glucose~~, rubber, sapropel, sapropelites, slates, and/or wood, into synthetic petroleum, comprising the steps of:
 - (a) isolating a starting microorganism capable of said conversion;
 - (b) isolating from the starting microorganism an oligonucleotide probe complementary to a gene responsible for the conversion ability;
 - (c) placing the probe under hybridizing conditions in contact with amplicons from other microorganisms suspected to be capable of or being capable of said conversion;
 - (d) isolating amplicons which hybridized; and

- (e) transfecting the isolated amplicons into a host microorganism;
- (f) combining the host microorganism with the solid fossil fuels or oil tars under conditions suitable for the conversion of the solid fossil fuels or oil tars into synthetic petroleum; and
- (g) determining whether productivity improved.

10. (Canceled)

11. (Currently amended) A method of converting carbon, hydrogen and oxygen into ~~fossil fuels, including synthetic coal and or synthetic petroleum, comprising the steps of:~~

- (a) isolating a starting microorganism capable of said conversion;
- (b) isolating from the starting microorganism the genes responsible for the conversion ability;
- (c) transfecting the genes into a host microorganism; and
- (d) combining the host microorganism with the carbon, hydrogen and oxygen under conditions suitable for the conversion of the carbon, hydrogen and oxygen into synthetic coal or synthetic petroleum.

12. (Currently amended) The method of claim 11 wherein, after transfection, the transfected host microorganism as compared to the starting microorganism is capable of faster growth, reproduction, enhanced survivability in [[the]]~~a~~ production environment, or more production of synthetic coal or synthetic petroleum per unit of a nutrient or starting fossil fuel or oil tar, than is the starting microorganism.

13. (Currently amended) The method of claim 11 wherein the host microorganism can exist in salt water or fresh water, can metabolize glucose, rubber, grass, or other nutrient media, ~~can~~

~~exist in rocky, sandy or sand/water environments, can survive heat, cold, or acidic or basic environments, can oxidize sulfur, or can exist in aerobic or anaerobic conditions.~~

14. (Original) The method of claim 11 wherein the genes responsible for conversion are isolated by subtractive hybridization.
15. (Original) The method of claim 14 wherein the subtractive hybridization is performed by representational difference analysis.
16. (Currently amended) The method of claim [[16]]15 wherein before transfection, the genes are selectively altered, and following transfection with such selectively altered genes, the host microorganisms with characteristics best suited to commercial production of synthetic coal or synthetic petroleum are selected.